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form. The timber is suitable for many purposes, saws readily, is fine grained and light brown. The burr and nut of both varieties are almost identical in size and appearance with the eastern chinquapin. They are difficult to obtain and are frequently attacked by a small whitish worm, the egg of which is deposited, as in the eastern chinquapin and chestnut, by a moth.

The writer suggests that the giant chinquapin be experimented with as a possible resistant species to reforest the eastern states devastated by the chestnut tree disease. The tree would probably stand the eastern conditions south of Maryland. The shrub is extremely hardy.

MARSDEN MANSON

SAN FRANCISCO, CAL.,

January 8, 1912

AN UNUSUAL EFFECT OF A LIGHTNING DISCHARGE

THE following note made by the writer under date of July 18, 1911, may be of interest: On the land of J. M. Dunklee (of Hawes postoffice, Ark.), in the N.E. $\frac{1}{4}$ of the N.E. $\frac{1}{4}$ of Sec. 11, T. 2 S., R. 20 W., the lightning struck an oak tree (according to Mr. Dunklee three years ago), much shattering it. The tree stood near the top of a sandstone ridge. The discharge passed to the roots of the tree, then followed in the ground down the north slope, tearing out a trench in places 3 feet wide, and which must at first have been 2½ feet deep. At this time, the depth is 1½ feet. The discharge followed down the slope 50 feet, tearing up the sandstone and throwing one block that is estimated to weigh 1,200 pounds up into the air and out of the trench. At the lower end of the trench, the discharge apparently passed beneath the surface, along a bedding plane between the upturned layers of sandstone. There is no evidence of any fusion of the rocks or the soil.

A. H. PURDUE

FAYETTEVILLE, ARK.,

January 10, 1912

"MISUSE OF THE TERM 'GENOTYPE'"

TO THE EDITOR OF SCIENCE: If the distinguished students of genetics whose communi-

cations have recently appeared in your pages do not imagine that their work is of interest to biologists and naturalists at large, then one is entitled to question their claim to so much of your space. Let them, one might say, confine their "terminological inexactitudes" to their own technical periodicals. If, however, they believe, as I do, that their highly valuable work should appeal to all biologists, and that it has a particularly important bearing on the methods and conclusions of the systematist, then surely they should try to avoid the use of terms that are liable to mislead the general naturalist, and that sooner or later must clash with those of the taxonomic biologist. But assuming that they persist in acting as though their work were either unworthy of general attention or far above the heads of all outside their charmed circle, still may one not appeal to them to recognize that serious writers in SCIENCE are at any rate their scientific colleagues, and as such have a claim to be treated with ordinary courtesy? To state, after what has been written, that Dr. Johannsen is the "originator of the word genotype" is to give either the cut direct or the lie direct to a fellow-worker.

F. A. BATHER

LONDON, ENGLAND,

January 17, 1912

SCIENTIFIC BOOKS

The Animals and Man. An Elementary Text-book of Zoology and Human Physiology. By VERNON LYMAN KELLOGG. New York, Henry Holt and Company. Pp. 495.

The present trend in high schools toward a combined course in human physiology and zoology is calling forth its inevitable train of new text-books, of which the present volume by Professor Kellogg is one. Knowing the writer's practise in text-book preparation and his wide experience as a teacher and a zoologist, one is justified in looking for something exceptional in this new effort, but the reviewer must confess to a feeling of disappointment on reading the book. It has the appearance of having been hastily constructed with a somewhat too liberal use of scissors and paste on

the author's earlier text-books. The section on human physiology (chapters XXI-XXVIII), by Miss McCracken, while interesting enough in itself as an abridged elementary account of human anatomy and physiology, stands almost wholly unrelated to the rest of the text. To the reviewer, the present need seems rather to be for a text-book of zoology so thoroughly permeated with physiological interpretations and applications that the zoology and physiology become a unit throughout the entire work. However, beyond the question of arrangement of material—a matter which will doubtless always remain largely one of individual opinion—the over-plentiful sprinkling of errors throughout the book lays it open to more serious criticism. For example, on page 32 in a description of the crayfish we read that "In the female the genital pores are in the basal segments of the next to the last pair of legs." On the same page *ligaments* are spoken of when *tendons* are meant, the digestive gland is described as yellow whereas it is characteristically reddish or greenish in color, and *four* pairs of ostia (a dorsal, two lateral and one ventral pair) opening into the heart are called for. On page 35 occurs a questionable usage of the term *ureters*. Again, in the light of recent investigations, we doubt if the statocyst of the crayfish is very generally "believed to be an auditory organ" (pp. 30, 74). On the same page one reads that "the longer pair of appendages are the antennæ and the sense of smell is believed to be located in the fine hair-like projections upon the joints." As a matter of fact, certain peculiar club-shaped organs on the outer ramus of the *antennules* have generally been considered the chief olfactory end-organs. Recent researches of Holmes and Homuth confirm this but show that other parts of the body (mouth parts, tip of chelipeds, inner ramus of antennules and the antennæ) are also sensitive to olfactory stimuli. On page 41 we find this astonishing statement in an account of conjugation in *Paramecia*, "... part of the macronucleus and micronucleus of each passes over to the other, and

the mixed elements fuse together to form a new macro- and micronucleus in each half." In view of the wonderfully adapted mechanism in the amphibian heart for keeping the "pure" and "impure" blood at least approximately separated, the statement regarding the ventricle of the toad (p. 23) that "here the pure and impure blood are mixed," might well be qualified somewhat. On pages 14 and 15 *quill feathers* and *contour feathers* are set apart as two contrasting groups. On page 47 occurs the statement that "in addition to the proteids protoplasm usually contains native albumins," etc.; native albumins, of course, being proteins. Throughout the book the word *proteid* is used instead of the preferable *protein*. On page 100, speaking of the pairs of legs, the statement is made that "the order of their appearance differs in the toad tadpole and the frog tadpole." One is led to suspect that the author had in mind rather anuran and urodele tadpoles respectively. On page 153 we are inaccurately informed that "hermit crabs all have the habit of carrying about with them, as a protective covering into which to withdraw, the spiral shell of some gastropod mollusc," and in the same paragraph, speaking of the abdomen of the hermit crab, occurs the statement that "it has on it no legs or appendages except a pair for the hindmost segment, which are modified into hooks for holding fast to the interior of the shell." As a matter of fact while generally absent from the right side of the abdomen (except on the sixth somite), the pleopods of the left side, though often much reduced, are present, and in the female are used for the attachment of the eggs. On page 154 in speaking of the acorn barnacles the "six calcareous plates" mentioned are characteristic of the family *Hexameridae* only and not of all "acorn barnacles." On page 170 we are told that "the cuttlefishes and octopi have no foot," but on page 178 that "the decapods, as their name indicates, have ten feet or arms," etc. Aside from this contradiction in statement, the high school student might pertinently inquire what the

name *Cephalopoda* indicates. On page 191 it is stated that "nearly all the Chordata are marked by the presence, either in embryonic or larval stages only, or else persisting throughout life, of a number of slits or clefts in the walls of the pharynx which serve for breathing, and which are called gill-slits." Do not *all* Chordata have gill-clefts at some stage of their life history? Again, on page 201 one reads the too inclusive statement that "all batrachians breathe by means of gills for a longer or shorter time after birth." On page 256, hyenas are classified as *Felidae*. On page 337 we are informed that muscles are the active organs of motion and locomotion in all animals.

In the physiological section there is an obvious attempt to "write down" to the audience and the result is frequently anything but happy. For instance one meets not infrequently with such apparently significant though actually meaningless statements as (p. 291) "the most necessary element in all the world is oxygen." On page 294 one encounters the rather astonishing bit of information that "muscle is largely a compound of sulphur and other elements." On page 316 we read that "it is the function of hæmoglobin to carry oxygen to the tissues and carbon dioxide from the tissues," a statement which, to say the least, is misleading, in that as regards carbon dioxide, the carrying power of hæmoglobin is at most of minor importance. On page 340 heart muscle is classified as non-striated. On page 291 we encounter the obscure and in part erroneous statement that "carbohydrates contain carbon, hydrogen and oxygen, the former predominating. Fats contain also chiefly oxygen, carbon and hydrogen, the latter predominating." On page 296 under "Tests for Proteids" what is probably the most universal and certain test of all, the biuret reaction, is omitted. On page 301 referring to alcohol we find this remarkable piece of information—remarkable both in point of fact and of rhetorical climax—"unlike other poisons its use establishes a craving or appetite for it which eventually

weakens the will and is apt to lead to intoxication." How *unlike* cocaine, opium, morphine, etc., is it in this cumulative effect? On page 311 we learn that "the mesentery is fastened at the back to the spinal column." On page 363 instead of using axon and axis cylinder as synonymous terms the axis cylinder is spoken of as a central fiber of the axon. On page 317 the term *fibrin* is misused.

A careful reading of the text discloses a considerable number of little inaccuracies, mainly in the way of too inclusive statements, but space will not permit of specific citation. Some of these may perhaps be excusable on the basis of being well-nigh unavoidable in an elementary book where confusion of ideas must be avoided, but in not a few instances a single qualifying word would have set the matter right.

While the reviewer has found it necessary to devote most of his space to pointing out errors, he does not wish to leave the impression that the book is without merit. On the contrary, it has many excellencies. The subject-matter is well chosen, the general descriptive treatment is for the most part excellent and interestingly written and the text covers a wide range of timely topics in addition to the more formal zoological work.

M. F. GUYER

UNIVERSITY OF WISCONSIN

A FEW BOOKS ON AERONAUTICS

A NEW science and a new industry, a new sport and a new mode of warfare have come upon us with such startling suddenness that many are clamoring to know how it all came about; while authors are tumbling over each other—many over the facts and even over their English too—in a mad rush to tell the story, the story of aeronautics that only a master can tell.

The following are a few of the 1911 versions of this story.

Aerial Locomotion. By E. H. HARPER and ALLEN FERGUSON. Cambridge University Press, XII., 164, price 1 shilling.

This little book is so clearly written that it